UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,971	02/05/2004	Joseph Z. Lu	120 06799US	5188

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EXAMINER
LO, SUZANNE

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/772,971	LU, JOSEPH Z.
	Examiner	Art Unit	
	Suzanne Lo	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 October 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-27</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-27</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>05 February 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/20/06</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-27 have been presented for examination.

Information Disclosure Statement

2.   The information disclosure statement (IDS) submitted on 10/20/06 is in compliance with the

provisions of 37 CFR 1.97. Accordingly, the Examiner has considered the IDS as to the merits.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis

for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   **Claims 1-2, 12-13, and 20-21 are rejected** under 35 U.S.C. 102(e) as being clearly anticipated

by Madievski et al. (U.S. Patent Application Publication 2004/0057585 A1).

As per claim 1, Madievski is directed to a method, comprising: receiving a projection associated

with a first signal and a second signal, the second signal comprising a first portion associated with the

first signal and a second portion not associated with the first signal, the projection at least *partially*

isolating the first portion of the second signal from the second portion of the second signal ([0008]-

[0012], [0050]); identifying one or more parameters of a model using at least a portion of the projection,

the model associating the first signal and the first portion of the second signal ([0043]); *and outputting the*

one or more model parameters for use in processing one or more signals ([0043]).

As per claim 2, Madievski is directed to the method of claim 1, wherein identifying the one or more model parameters comprises: identifying one or more pole candidates and one or more model candidates using the projection ([0044]-[0045]); and selecting at least one of the one or more pole candidates and selecting at least one of the one or more model candidates as the model parameters ([0046]-[0047]).

As per claim 12, Madievski is directed to an apparatus, comprising: at least one input operable to receive a first signal and a second signal, the second signal comprising a first portion associated with the first signal and a second portion not associated with the first signal ([0008]-[0012]); and at least one processor operable to generate a projection associated with the first and second signals and to identify one or more parameters of a model associating the first signal and the first portion of the second signal using at least a portion of the projection, the projection at least *partially isolating* the first portion of the second signal from the second portion of the second signal ([0043]) and *output the one or more model parameters for use in processing one or more signals.*

As per claim 13, Madievski is directed to the apparatus of claim 12, wherein the at least one processor is operable to identify the one or more model parameters by: identifying one or more pole candidates and one or more model candidates using the projection ([0044]-[0045]); and selecting at least one of the one or more pole candidates and selecting at least one of the one or more model candidates as the model parameters ([0046]-[0047]).

As per claim 29, Madievski is directed to the apparatus of claim 12, wherein the at least one processor is operable to output the one or more model parameters for use in processing one or more signals by: storing the one or more model parameters ([0042]); and using the one or more stored model parameters to de-noise the second signal ([0047]-[0048], [0055]).

As per claim 20, Madievski is directed to a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable

program code for: receiving a projection associated with a first signal and a second signal, the second

signal comprising a first portion associated with the first signal and a second portion associated with at

least one disturbance, the projection at least *partially isolating* the first portion of the second signal from

the second portion of the second signal ([0008]-[0012], [0050]); identifying one or more parameters of a

model associating the first signal and the first portion of the second signal using at least a portion of the

projection ([0043]); *and outputting the one or more model parameters for use in processing one or more*

signals ([0043]).

As per claim 21, Madievski is directed to the computer program of claim 20, wherein the

computer readable program code for identifying the one or more model parameters comprises computer

readable program code for: identifying one or more pole candidates and one or more model candidates

using the projection ([0044]-[0045]); and selecting at least one of the one or more pole candidates and

selecting at least one of the one or more model candidates as the model parameters ([0046]-[0047]).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as
> set forth in section 102 of this title, if the differences between the subject matter sought to be
> patented and the prior art are such that the subject matter as a whole would have been obvious at
> the time the invention was made to a person having ordinary skill in the art to which said subject
> matter pertains. Patentability shall not be negatived by the manner in which the invention was
> made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966),

that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are

summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.

3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or
        nonobviousness.

4.   **Claims 3-4, 14-15, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over**

Madievski et al. (U.S. Patent Application Publication 2004/0057585 A1) **in view of Repucci et al. (U.S.**

Patent Application Publication 2005/0015205 A1).

As per claim 3, Madievski is directed to the method of claim 1, but fails to specifically disclose

wherein: the projection comprises an orthogonal matrix and an upper triangular matrix; and the upper

triangular matrix has a plurality of values along a first diagonal of the upper triangular matrix, each value

being greater than or equal to zero. Repucci teaches projecting a matrix by performing canonical QR-

decomposition on the matrix with an orthogonal matrix and an upper triangular matrix ([0010], [0073],

page 8, [0101]). Madievski and Repucci are analogous art because they are from the same field of

endeavor, modeling and separating mixed signals. It would have been obvious to one of ordinary skill in

the art at the time of the invention to combine the method of separating signals of Madievski with the

matrix projection method of Repucci in order to minimize error in the modeled signals (**Repucci, page 8,**

[0101]).

As per claim 4, the combination of Madievski and Repucci already discloses the method of claim

3, wherein identifying the one or more model parameters comprises: defining one or more areas in the

upper triangular matrix (**Repucci, [0101]**); and identifying one or more pole candidates using the one or

more defined areas, the one or more model parameters comprising at least one of the one or more pole

candidates (**Madievski [0045] and Repucci [0105]-[0106]**).

As per claim 28, Madievski is directed to the method of claim 1, but fails to explicitly disclose

wherein the projection at least partially isolates the first portion of the second signal from the second

portion of the second signal in an orthogonal space. Repucci teaches projecting a matrix by performing

canonical QR-decomposition on the matrix with an orthogonal matrix and an upper triangular matrix

([0010], [0073], page 8, [0101]). Madievski and Repucci are analogous art because they are from the same field of endeavor, modeling and separating mixed signals. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method of separating signals of Madievski with the matrix projection method of Repucci in order to minimize error in the modeled signals (**Repucci, page 8, [0101]**).

As per claim 14, Madievski is directed to the apparatus of claim 12, but fails to specifically disclose wherein: the projection comprises an orthogonal matrix and an upper triangular matrix; and the upper triangular matrix has a plurality of values along a diagonal of the upper triangular matrix, each value being greater than or equal to zero. Repucci teaches projecting a matrix by performing canonical QR-decomposition on the matrix with an orthogonal matrix and an upper triangular matrix ([0010], [0073], page 8, [0101]). Madievski and Repucci are analogous art because they are from the same field of endeavor, modeling and separating mixed signals. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method of separating signals of Madievski with the matrix projection method of Repucci in order to minimize error in the modeled signals (**Repucci, page 8, [0101]**).

As per claim 15, the combination of Madievski and Repucci already discloses the apparatus of claim 14, wherein the at least one processor is operable to identify the one or more model parameters by: defining one or more areas in the upper triangular matrix (**Repucci, [0101]**); and identifying one or more pole candidates using the one or more defined areas, the one or more model parameters comprising at least one of the one or more pole candidates (**Madievski [0045] and Repucci [0105]-[0106]**).

As per claim 22, Madievski is directed to the computer program of claim 20, but fails to disclose wherein: the projection comprises an orthogonal matrix and an upper triangular matrix; and the upper triangular matrix has a plurality of values along a diagonal of the upper triangular matrix, each value

being greater than or equal to zero. Repucci teaches projecting a matrix by performing canonical QR-decomposition on the matrix with an orthogonal matrix and an upper triangular matrix ([0010], [0073], page 8, [0101]). Madievski and Repucci are analogous art because they are from the same field of endeavor, modeling and separating mixed signals. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the method of separating signals of Madievski with the matrix projection method of Repucci in order to minimize error in the modeled signals (**Repucci, page 8, [0101]**).

Allowable Subject Matter

5.   Claims 5-11, 16-19, and 23-27 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: Applicants are disclosing a method, apparatus, and program for receiving a projection associated with a first signal and a second signal, and identifying parameters of a model using a portion of the projection, identifying pole candidates and model candidates as model parameters wherein the projection comprises an orthogonal matrix and an upper triangular matrix. This has been disclosed in the prior art of record.

The prior art of record does not disclose wherein the upper triangular matrix comprises the first diagonal and a second diagonal, the diagonals dividing the upper triangular matrix into upper, lower, left, and right sections; and the one or more defined areas in the upper triangular matrix are located in the right section of the upper triangular matrix and wherein defining the one or more areas in the upper triangular matrix comprises defining multiple areas in the upper triangular matrix; and identifying the one or more model parameters comprises identifying one or more model parameters for each of the defined areas in the upper triangular matrix.

The closest prior art uncovered during examination teaches certain limitations of the claimed

invention as follows:

U.S. Patent No. 4,740,968 issued to Aichelmann, Jr.: Discloses a matrix with diagonal quadrants

but the matrix is directed to an error correction code matrix wherein the matrix is a not an upper triangular

matrix (column 2, lines 26-32).

These features relating to the specific sequence of method steps, apparatus components, and

computer program as noted above renders dependent claims 5-11, 16-19, and 23-29 non-obvious over the

prior art of record.

Response to Arguments

6.   The rejections under 35 U.S.C. 112 have been withdrawn due to the amended claims.

Applicant's arguments filed 10/20/06 have been fully considered but they are not persuasive.

7.   Claims 1-29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-

statutory subject matter. Specifically, claims 1-11 produce no tangible result. Only identification and

selection of parameters occur without any output of the parameters in a tangible form i.e. display, output

file. The model parameters are data only and the intended use of processing one or more signals does not

cure this deficiency. Also, claims 1-29 do not allow the usefulness of the invention to be realized as the

identification and selection of parameters can be reasonably interpreted as occurring with a processor

without any method to access the parameters. Furthermore, while the parameters are stored in claim 29,

the parameters are then used to denoise a signal, and as the parameters are no longer the output of the

method while the output of claim 29 is the denoised signal which is non-statutory and not tangible, the

storing of parameters does not cure the deficiency of the rejected claims.

8.   In response to the Applicant's argument that Madievski does not teach a projection that at least

partially isolates a first portion of a second signal from a second portion of the second signal, Applicant is

directed to paragraph [0043] of Madievski where the determining of parameters is achieved by Blind

Signal Separation techniques and wherein "Blind signal separation: statistical principles" by Cardoso et

al. is incorporated by reference. As apparent to any ordinary person skilled in the art, projection is

inherent in blind signal separation. Furthermore, Applicant is directed to paragraph [0050] wherein *"the*

output source signals may be separated individually as a product of particular row of the matrix W^T and

column of the matrix X", as one signal is derived from a particular row of the matrix W^T, portions of the

signal have been isolated within that particular row. In response to the Applicant's argument that

Madievski does not teach identification of one or more parameters of a model using at least a portion of

the projection, as the Examiner has shown that Madievski does indeed use a projection to identify

parameters ([0044]-[0045]), the above limitation is indeed satisfied.

Conclusion

9.   THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set

forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from

the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing

date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH

shortened statutory period, then the shortened statutory period will expire on the date the advisory action

is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX

MONTHS from the mailing date of this final action.

10.   The prior art made of record is not relied upon because it is cumulative to the applied rejection.

These references include:

1. U.S. Patent No. 6,564, issued to Kadtke et al. on 05/13/06.

2. U.S. Patent Application Publication 2004/0071103A1 published by Henttu on 04/15/04.

3. "Blind signal separation with a projection pursuit index" published by Sarajedini et al. in 1998.

4. "Blind Deconvolution of Dynamical Systems: A State-Space Approach" published by Zhang et al. in March 2000.
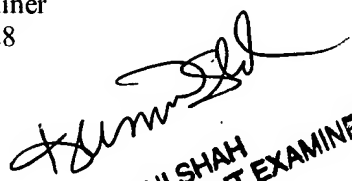
11.   All Claims are rejected.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suzanne Lo whose telephone number is (571)272-5876. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2297. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Suzanne Lo
Patent Examiner
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SL
11/08/06

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SUPERVISORY PATENT EXAMINER